

VII. *On the terminal ventral segments of the abdomen in Prosopis, and other Anthophila.* By EDWARD SAUNDERS, F.L.S.

[Read March 1st, 1882.]

PLATE VI.

MANY authors have described and figured the genital armature of the males in *Bombus* and other genera of Aculeate Hymenoptera, but I cannot find that much attention has been paid to the hidden ventral valves of the two segments that immediately precede it, *i. e.*, of the 7th and 8th; indeed, very few authors have mentioned the 8th segment in the imago at all, although this segment is very clearly present in all the species I have examined, and in many its ventral valve affords excellent specific characters.

Leon Dufour ('Recherches Anatomiques.' &c.) certainly noticed the ventral valve of this segment in the genera *Apathus*, *Bombus*, &c., but he considered it as a part of the genital armature, calling it the "hypotome," and saying that it is inserted or perhaps articulated to a common plate, fixed at the base of the armature below.

I think there is no doubt that he was wrong in thinking that this plate is in any way united with the armature, for I have specimens which clearly show its connection with a membrane, which unites it to a membranous or sometimes corneous plate, which projects beyond the apex of the 7th dorsal segment, when the abdomen is much extended, and which, I think, is evidently its dorsal valve.

In extracting the genitalia from dried specimens, the membrane uniting the ventral and dorsal plates of the 8th segment, and often also of the 7th, generally gets torn away, and the ventral plates come away with the armature, so that they have quite the appearance of being part of the actual armature itself. They are, however, easily detached, and the shining smooth under surface of the armature shows no sign of having had any attachment.

It is, I think, quite clear that the abdomen of an aculeate hymenopterous insect should consist of nine segments. Packard, in the 'Proceedings of the Boston Society of Natural History,' vol. x., points out that of the fourteen segments of the larva (counting the head as one), the first represents the head in the perfect insect, the next four the thorax (*i. e.*, including the 5th larval segment, which he shows is taken up into the metathorax during the larval changes), and the remaining nine the abdomen; Packard also points out that the male genitalia are visible in the larva as three pairs of tubercles on the sternal portion of the 9th ring, which 9th ring no doubt represents what we call the genital armature in the imago. Eight segments now remain to be accounted for, and all these, I find, present in such bees as I have examined.

The form of the 8th ventral plate in the male varies very greatly, and appears to afford excellent characters in some genera for sectional purposes. It is this 8th ventral plate which projects somewhat in the form of a spoon at the apex of the abdomen in *Andrena*, and which has been considered as the 7th by many authors; the 7th, however, in this genus lies under the 6th, and is rarely, if ever, visible; the same form of the segment occurs in *Panurgus*, *Cilissa*, *Dasypoda*, and *Macropis*. In *Panurgus* all the ventral segments are visible, as the apex of the 6th is largely and widely emarginate, allowing the 7th to be seen through the emargination. In *Megachile*, where only four ventral segments are visible, the 8th is a mere tongue-like plate lying close to the under side of the genital armature. In our other British genera the 8th is almost always hidden, but in *Prosopis* it is hidden in nearly all the species, and very conspicuously exhibited in one (*hyalinata*). On the Continent there are two or three others which belong to the same section as *hyalinata*, but the section is a very small one compared to the great number of species known.

In *Prosopis* the forms of the 7th and 8th ventral plates are most curious and interesting in all the species, and I have figured these segments of each to show how characteristic they are. As will be seen, they are perfectly distinct in shape, and differ to such an extent in some cases as to make one doubt whether all the species really belong to one genus. The great similarity, however, of the general structural characters throughout the species makes me

hesitate to divide such a well-known and easily recognised genus, especially as I have failed to find any corresponding characters in the female.

I have not here touched upon the peculiarities exhibited in the final segment or genital armature, although they are equally distinct and characteristic in each, for I hope to describe and figure them shortly in the second part of my 'Synopsis of the British Hymenoptera.'

I have also so far sought in vain for any corresponding features in the terminal segments of the female, but I have only dried specimens to work from, and hope, with freshly-killed examples, to be able to pursue my investigations more satisfactorily.

EXPLANATION OF PLATE VI.

	A, 8th ventral plate.	B, do., lateral view.	c, 7th ventral plate.
1. <i>P. cornuta</i> , Sm.	{		
2. <i>P. dilatata</i> , Kirb.	do.	do.	do.
3. <i>P. communis</i> , Nyl.	do.	do.	do.
4. <i>P. hyalinata</i> , Sm.	do.	do.	do.
5. <i>P. confusa</i> , Nyl.	do.	do.	do.
6. <i>P. signata</i> , Panz.	do.	do.	do.
7. <i>P. punctulatissima</i> , Sm.	do.	...	do.
8. <i>P. pictipes</i> , Nyl.	do.	do.	do.
9. <i>P. brevicornis</i> , Nyl.	do.	do.	do.

Note.—Since reading the above, Mr. Fitch has called my attention to two interesting papers bearing on this subject, one by Dr. H. Reinhard (Berl. Ent. Zeit. 1865, p. 187), and the other by Dr. H. Schaum (Ann. Mag. Nat. Hist., March, 1863). The latter author, however, only finds thirteen segments in the larvæ of Hymenoptera, including the head, and on this ground, admitting as he does the transfer of the 5th abdominal segment to the metathorax, there is difficulty in accounting for the eight abdominal segments exclusive of the genitalia, which are present in the imago.